

WHAT IS CLAIMED IS:

1. In an implantable cardiac device, a method for determining a maximum observed heart rate of a patient during exercise, comprising:

(a) monitoring a changing heart rate of the patient and producing heart rate measurements;

(b) monitoring activity level of the patient; and

(c) identifying a heart rate as the maximum observed heart rate when the following conditions occur: (i) the activity level exceeds an activity threshold, (ii) a heart rate measurement is greater than a stored heart rate measurement, and (iii) a difference between the heart rate measurement and the stored heart rate measurement does not exceed a predetermined threshold.

2. The method of claim 1, wherein step (c) comprises identifying the maximum observed heart rate when the activity level exceeds the activity threshold for a predetermined period of time.

3. The method of claim 2, wherein step (c) comprises identifying the maximum observed heart rate when the activity level exceeds the activity threshold for at least two minutes.

4. The method of claim 2, further comprising the step of storing said maximum observed heart rate identified in step (c) as a new stored heart rate measurement.

5. The method of claim 1, wherein step (c) comprises:  
comparing the activity level with the activity threshold to determine when the activity level exceeds the activity threshold;

comparing the heart rate measurement with the stored heart rate measurement to determine when the heart rate measurement is greater than the stored heart rate measurement;

comparing the difference between the heart rate measurement and the stored heart rate measurement to determine when the difference does not exceed a predetermined threshold; and

identifying a heart rate as the maximum observed heart rate when all said comparisons are met.

6. The method of claim 1, further comprising determining one or more of the following: heart rate intensity, percent oxygen consumption ( $\%VO_2$ ) reserve, metabolic equivalents (METS), percentage METS, and workload.

7. An implantable cardiac device for determining a maximum observed heart rate of a patient during exercise, comprising:

means for monitoring a changing heart rate of the patient and producing heart rate measurements;

means for monitoring activity level of the patient;

means for identifying a heart rate as the maximum observed heart rate when the following conditions occur: (i) the activity level exceeds an activity threshold, (ii) a heart rate measurement is greater than a stored heart rate measurement, and (iii) a difference between the heart rate measurement and the stored heart rate measurement does not exceed a predetermined threshold; and

means for transmitting the maximum observed heart rate to an external device.

8. In an implantable cardiac device, a method for determining workload of a patient during exercise, comprising:

(a) monitoring a changing heart rate of the patient and producing heart rate measurements;

(b) monitoring activity level of the patient; and

(c) determining workload of the patient using at least one heart rate measurement when the activity level exceeds an activity threshold.

9. The method of claim 8, wherein step (c) comprises determining workload of the patient when the activity level exceeds the activity threshold for a predetermined period of time.

10. The method of claim 8, wherein step (c) comprises determining workload of the patient using heart rate measurements over a predetermined period of time.

11. The method of claim 8, further comprising determining one or more of the following: heart rate intensity, percent oxygen consumption ( $\%VO_2$ ) reserve, metabolic equivalents (METS), and percentage METS.

12. An implantable cardiac device for determining workload of a patient during exercise, comprising:

means for monitoring a changing heart rate of the patient and producing heart rate measurements;

means for monitoring activity level of the patient;

means for determining work of the patient using at least one heart rate measurement when the activity level exceeds an activity threshold; and

means for transmitting the work of the patient to an external device.